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What is claimed

~~CLAIMS~~

1. A process for producing transgenic eucaryote cells which comprises: contacting a culture of untransformed cells with an inhibitor of poly-(ADP-ribose) polymerase, prior to transformation, for a period of time sufficient to reduce the response of the cultured cells to stress and to reduce the metabolism of said cultured cells, particularly to reduce the electron flow in the mitochondrial electron transport chain; contacting said untransformed cells with foreign DNA comprising at least one gene of interest under conditions in which said foreign DNA is taken up by said untransformed cells and said gene of interest is stably integrated in the nuclear genome of said untransformed cells to produce said transgenic cells; and
optionally recovering said transgenic cells from said culture.

2. The proces of claim 1, wherein said eucaryotic cells are plant cells.

3. The process of claim 1 or 2, wherein said inhibitor is niacinamide, preferably at a concentration of about 150 mg/l to 1000 mg/l, more preferably at a concentration of about 200 mg/l to 500 mg/l, particularly at a concentration of about 250 mg/l.

4. The process of any one of claims 1 to 3, wherein said untransformed cells are cultured in a medium containing said inhibitor for a period of time of approximately 2 to 28 days, preferably approximately 3 to 14 days, particularly approximately 4 days prior to the contacting with said foreign DNA.

5. The process of any one of claims 1 to 4, wherein said cells contacted with said foreign DNA are further cultured in a medium containing said inhibitor

for a period of time of approximately 1 to 14 days, preferably 2 to 4 days after contacting with said foreign DNA.

6. A process for increasing the frequency of obtaining transgenic plant cells which comprises:

contacting untransformed plant cells with foreign DNA comprising at least one gene of interest under conditions in which said foreign DNA is taken up by said untransformed cells and said gene of interest is stably integrated in the nuclear genome of said untransformed cells to produce said transgenic cells

contacting cells with an inhibitor of poly-(ADP-ribose); and

further culturing said cells in a medium containing said inhibitor for a period of time of approximately 1 to 14 days, preferably 1 to 4 days, particularly 1 day after contacting with said foreign DNA.

7. The proces of any of claims 1 to 6, wherein said gene of interest comprises a promoter that directs expression selectively in certain cells or tissues of an eucaryotic organism.

8. The process of any one of claims 2 to 7, wherein said gene of interest comprises a promoter that directs expression selectively in stamen cells, particularly anther cells of a plant.

9. The process of claim 7 or 8, wherein said gene of interest encodes a protein that, when produced in a cell of an eucaryotic organism, kills or disables said cell.

10. The process of claim 9, wherein said gene of interest encodes a ribonuclease, particularly barnase.

11. The process of any one of claims 1 to 10, wherein a transgenic organism having said foreign DNA with said at least one gene of interest stably integrated in its genome is obtained from said transformed eucaryotic cell.

12. The proces of claim 11, wherein said organism is a plant which is obtained by regeneration from a transformed plant cell.

13. The transgenic organism obtained by the process of claim 11 or 12.

14. A plant having foreign DNA integrated in the nuclear DNA of its cells only in the regions of said nuclear DNA that are transcriptionally active in said cells of said plant when said cells are treated with an effective amount of a PARP inhibitor for a period of time sufficient to reduce cell metabolism to a state where gene expression is essentially limited to genes expressed irrespective of the differentiated or physiological condition of the cell.

15. The plant according to claim 14, wherein said integration of the foreign DNA in said transcriptionally active region is verified by measuring the level of expressed mRNA corresponding to this foreign DNA when said cells are incubated in a medium containing a PARP-inhibitor.

16. The plant according to claim 14, wherein said transcriptionally active regions of the genome of said plant include regions which are minimally affected by cell differentiation or cell physiological and biochemical changes caused by external factors such as environmantal conditions, especially stress conditions.

17. The plant or plant cell according to any one of the preceeding claims, wherein said plant or plant cell is a monocotyledonous plant or plant cell.

18. The plant or plant cell according to claim 17, wherein said plant or plant cell is a cereal plant or plant cell.

19. The plant of plant cell acccording to claim 18, wherein said plant or plant cell is wheat or a wheat cell.

20. The plant according to any one of the preceeding claims, wherein said foreign DNA comprises a DNA sequence expressed selectively in specific tissues of said plant.

21. The plant of claim 20, wherein said foreign DNA comprises a DNA sequence encoding a cytotoxic molecule.

22. The plant of claim 21, wherein said foreign DNA comprises a DNA sequence encoding barnase.

23. A eucaryotic cell having foreign DNA integrated in its nuclear DNA only in the regions of said nuclear DNA that are transcriptionally active in said cell when said cell is treated with an effective amount of a PARP inhibitor for a period of time sufficient to reduce cell metabolism to a state where gene expression is essentially limited to genes expressed irrespective of the differentiated or physiological condition of the cell.

Add B1

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